

CLAIMS:

1. An image data producing method comprising the steps of irradiating an image carrier including independently formed and two-dimensionally distributed specimen spots, at least of which contain a fluorescent substance, with a stimulating ray to excite the fluorescent substance contained in the specimens, stopping the irradiation of the image carrier with the stimulating ray, and photoelectrically detecting residual fluorescence emission released from the fluorescent substance contained in the specimens after stopping the irradiation with the stimulating ray using a two-dimensional area sensor.

2. An image data producing method in accordance with Claim 1, wherein the steps of irradiating the image carrier with the stimulating ray to excite the fluorescent substance contained in the specimens, stopping the irradiation of the image carrier with the stimulating ray, and photoelectrically detecting residual fluorescence emission released from the fluorescent substance contained in the specimens after stopping the irradiation with the stimulating ray using the two-dimensional area sensor are repeated two or more times.

3. An image data producing method in accordance with Claim 1, wherein the steps of irradiating the image carrier with the stimulating ray to excite the fluorescent substance contained in the specimens, stopping the irradiation of the image carrier with the stimulating ray, and photoelectrically detecting residual fluorescence emission released from the fluorescent substance contained in the specimens after stopping the irradiation with the stimulating ray using the two-dimensional area sensor are performed by synchronizing on and off operations of at least one stimulating ray source for emitting a stimulating ray and opening and closing operations of a shutter of the two-dimensional area sensor.

4. An image data producing method in accordance with Claim 1,
wherein the steps of irradiating the image carrier with the stimulating
ray to excite the fluorescent substance contained in the specimens,
stopping the irradiation of the image carrier with the stimulating ray, and
5 photoelectrically detecting residual fluorescence emission released from
the fluorescent substance contained in the specimens after stopping the
irradiation with the stimulating ray using the two-dimensional area
sensor are performed by synchronizing on-off operations of at least one
stimulating ray source for emitting a stimulating ray and opening and
10 closing operations of a shutter of the two-dimensional area sensor using a
chopper.

5. An image data producing method in accordance with Claim 1,
wherein image data are produced by detecting residual fluorescence
emission by the two-dimensional area sensor via a filter for cutting at
15 least light having a wavelength of the stimulating ray.

6. An image data producing method in accordance with Claim 1
wherein image data are produced by detecting residual fluorescence
emission by the two-dimensional area sensor via a Fresnel lens.

7. An image data producing method in accordance with Claim 1,
20 wherein image data are produced by using a CCD camera as the two-
dimensional area sensor.

8. An image data producing method in accordance with Claim 7,
wherein image data are produced by using a cooled CCD camera as the
two-dimensional area sensor.

25 9. An image data producing method in accordance with Claim 1,
wherein a micro-titer plate formed with numerous wells holding
specimens labeled with a fluorescent dye is used as the image carrier.

10. An image data producing apparatus comprising at least one

stimulating ray source for emitting a stimulating ray, a stage on which an image carrier including independently formed and two-dimensionally distributed specimen spots, at least some of which contain a fluorescent substance, is to be placed, a two-dimensional area sensor, and a control

5 means for irradiating the image carrier placed on the stage with a stimulating ray emitted from the at least one stimulating ray source, thereby exciting a fluorescent substance contained in the specimens, stopping the irradiation with the stimulating ray and causing the two-dimensional area sensor to photoelectrically detect residual fluorescence
10 emission released from the fluorescent substance contained in the specimens.

11. An image data producing apparatus in accordance with Claim 10 wherein the control means is constituted so as to repeat the steps of irradiating the image carrier placed on the stage with a stimulating ray
15 emitted from the at least one stimulating ray source, thereby exciting a fluorescent substance contained in the specimens, stopping the irradiation with the stimulating ray and causing the two-dimensional area sensor to photoelectrically detect residual fluorescence emission released from the fluorescent substance contained in the specimens two or
20 more times.

12. An image data producing apparatus in accordance with Claim 10, wherein the control means is constituted so as to synchronize on and off operations of at least one stimulating ray source and opening and closing operations of a shutter of the two-dimensional area sensor in such a
25 manner that the shutter of the two-dimensional area sensor is closed when the at least one stimulating ray source is held on and it is opened only when the at least one stimulating ray source is held off, thereby irradiating the image carrier placed on the stage with a stimulating ray

emitted from the at least one stimulating ray source to excite a fluorescent substance contained in the specimens, stopping the irradiation with the stimulating ray and causing the two-dimensional area sensor to photoelectrically detect residual fluorescence emission released from the fluorescent substance contained in the specimens.

13. An image data producing apparatus in accordance with Claim 10, which further comprises a disk-like rotatable chopper having at least two openings and the control means is constituted so as to control the rotation of the chopper in such a manner that a light detecting surface of the two-dimensional area sensor is covered by the chopper when one of the openings of the chopper is located in an optical path of the stimulating ray emitted from the at least one stimulating ray source and one of the openings of the chopper is located in front of the light detecting surface of the two-dimensional area sensor only when the chopper is located in the optical path of the stimulating ray emitted from the at least one stimulating ray source to cut the stimulating ray.

14. An image data producing apparatus in accordance with Claim 13, which further comprises a light guide for leading a stimulating ray emitted from the at least one stimulating ray source and the control means is constituted so as to control the rotation of the chopper in such a manner that a light detecting surface of the two-dimensional area sensor is covered by the chopper when one of the openings of the chopper is located in front of a stimulating ray emitting end portion of the light guide and one of the openings of the chopper is located in front of the light detecting surface of the two-dimensional area sensor only when the chopper is located in front of the stimulating ray emitting end portion of the light guide to cut the stimulating ray.

15. An image data producing apparatus in accordance with Claim 14,

wherein the light guide is constituted by an optical fiber bundle.

16. An image data producing apparatus in accordance with Claim 13, wherein the chopper is formed with four openings.

17. An image data producing apparatus in accordance with Claim 10,
5 which further comprises a filter for cutting at least light having a wavelength of the stimulating ray.

18. An image data producing apparatus in accordance with Claim 10, which further comprises a Fresnel lens between the stage and the two-dimensional area sensor.

10 19. An image data producing apparatus in accordance with Claim 10, wherein the two-dimensional area sensor is constituted as a CCD camera.

20. An image data producing apparatus in accordance with Claim 19, wherein the two-dimensional area sensor is constituted as a cooled CCD camera.

15 21. An image data producing apparatus in accordance with Claim 10, wherein the image carrier is constituted by a micro-titer plate formed with numerous wells holding specimens labeled with a fluorescent dye.